

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.hkpj-online.com](http://www.hkpj-online.com)

## RESEARCH REPORT

# Promotion of healthy nutrition in clinical practice: A cross-sectional survey of practices and barriers among physiotherapists in southeast Nigeria



Ukachukwu Okoroafor Abaraogu, BMR(PT), MSc, PhD  
Candidate <sup>a,b,\*</sup>, Mary O. Ogaga, BMR(PT) <sup>a</sup>,  
Eric Odidika, BMR(PT) <sup>a</sup>, Jose Frantz, PT PhD <sup>c</sup>

<sup>a</sup> Department of Medical Rehabilitation, Faculty of Health Science and Technology, College of Medicine, University of Nigeria Enugu Campus, Enugu, Nigeria

<sup>b</sup> School of Health and Life Sciences, Glasgow Caledonian University, Glasgow, Scotland, UK

<sup>c</sup> Department of Physiotherapy, Faculty of Community and Health Sciences, University of Western Cape, Bellville, South Africa

**KEYWORDS**

diet risk factors;  
lifestyle practice;  
nutritional  
counselling;  
physical therapists;  
preventing  
noncommunicable  
diseases

**Abstract** *Background:* Healthy diet counselling is an important concept in health promotion. Physiotherapists are well positioned to initiate or support healthy nutrition in addition to physical activity counselling, in routine patient consultation.

*Objective:* To determine the practices about and barriers to diet counselling practices among physiotherapists in Southeast Nigeria.

*Methods:* In this cross-sectional survey, a total of 140 questionnaires were distributed among physiotherapists.

*Results:* Overall, 103 physiotherapists responded. Physiotherapists are confident and consider the incorporation of dietary counselling very important and of high priority in their daily clinical work. They, however, assessed and counselled on dietary status opportunistically in patients. Notwithstanding, physiotherapists believed that the diet counselling they give could be effective in helping patients change their unhealthy dieting practices. Patients were also amenable to physiotherapists advocating on diet issues as part of their consultation. Several barriers to incorporating diet counselling into physiotherapy practice were identified, including lack of access to a dietician/health promotion staff/counsellors, lack of proper patient education materials, lack of expertise in relation to dietary risk factors' assessment and management, and uncertainty about what dietary services to provide.

\* Corresponding author. Department of Medical Rehabilitation, Faculty of Health Science and Technology, College of Medicine, University of Nigeria Enugu Campus, 400006 Enugu, Nigeria.

E-mail address: [ukachukwu.abaraogu@unn.edu.ng](mailto:ukachukwu.abaraogu@unn.edu.ng) (U.O. Abaraogu).

*Conclusion:* Although physiotherapists consider it important to incorporate diet counselling in their daily clinical practice, development and implementation of strategies to improve physiotherapists' diet counselling knowledge, competence, skills, and practice are warranted. Copyright © 2016, Hong Kong Physiotherapy Association. Published by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

The globalisation of food and beverage supply chains has increased the availability of cheap, calorie-rich, nutrient-poor foods and beverages that are attractive to the poor but aggravate the risks factor of noncommunicable diseases (NCDs) [1]. Consequently, public health indicators suggest that unhealthy nutrition is on the rise globally, and Nigeria is not immune to the effects of the changing dietary behaviours and preferences. There is evidence of emerging nutritional transition in Nigeria [2,3], arguably because of the rapid economic development in Nigeria, which is currently the largest economy in Africa and among the fastest growing in the world. As such, dietary behaviour has been affected greatly leading to a shift from healthy local foods to increasing consumption of processed, ready-to-eat junk foods and beverages. This, in association with an unhealthy lifestyle, may be contributing to the rising trend in the mortality and morbidity rates of NCDs in Nigeria [4].

All over the world, efforts are being intensified by all stakeholders, including healthcare professionals, to combat NCDs [4,5] including advocacy for a healthy diet. A healthy lifestyle may be considered an important contributor to good nutrition, both directly, because it should include an adequate diet, and indirectly, because it reduces the risk of diseases that adversely affect nutritional status. Thus, promoting healthy diets and lifestyles is important and one of the primary methods of promotion should be through providing information and education. A study conducted among 98 patients diagnosed with type 2 diabetes in Al-Buraimi Governorate, Oman, concluded that counselling largely illiterate diabetic patients about the impact of food, nutrition, and exercise on diabetes, shifted the patients from 'poor' to 'good' control in terms of metabolic outcome [6]. According to this study, the improvement in the metabolic outcome could be further enhanced by health education. Similarly, a Finnish study reported that lifestyle intervention focusing on diet and physical activity produced long-term beneficial changes in clinical and biochemical parameters and reduced risk of diabetes [7]. Findings from several other studies [8–10], including a recent systematic review [11], have also supported this evidence.

Physiotherapy is among the largest health profession [12] and a leading established healthcare profession that primarily explores nondrug interventions including patient counselling [13]. However, little is known about physiotherapists' health promotion practice, confidence, and effectiveness beyond that of physical activity counselling. To holistically address contemporary health trends and priorities in terms of NCD risk factors, the concepts of physiotherapy care are changing dramatically. The need for

physiotherapists to readjust their goals, strategies, and patterns of interaction with healthcare recipients and to include lifestyle counselling beyond physical activity counselling, is being increasingly emphasised [14,15].

Physiotherapists are remarkable for their association with noninvasive interventions with respect to health behaviour and lifestyle-related conditions. To diversify and fulfil the role of the contemporary physiotherapist within the context of interdisciplinary collaborative practice, there is a need for physiotherapists to continuously expand their expertise beyond treatment of disability and illness to include health-focused practice, specifically targeting primary and secondary disease prevention [14]. This may include the skills needed to provide nutritional counselling to patients in daily practice, as well as having the knowledge to know when referral to a dietician, physician, or other health professional is warranted in patients with nutritional risk factors. The physiotherapists' skill to undertake nutritional counselling will enable them to identify, during routine clinic visits, patients with nutritional risk factors and to make clinically expedient decision regarding suitable interventions or referrals to nutritionists or physicians, hence fostering inter-professional collaborative practice. The World Confederation for Physical Therapy (WCPT) 2015 template lifestyle practice supports member organisations to push beyond traditional boundaries towards a more interprofessional collaborative practice and person-centred integrated service delivery, which are necessary for the successful prevention and management of NCDs and their risk factors [5,14].

A recent systematic review concluded that physiotherapists have the potential to effectively counsel patients with respect to lifestyle behaviour changes (including increasing physical activity, quitting smoking, improving nutrition, and reducing weight) alone or as supporters of health counselling initiated by other healthcare team members [13]. Physiotherapists are confident with counselling, particularly in relation to promoting physical activity [15–17], but less confident with respect to counselling for other aspects such as smoking cessation [18]. Arguably, nutrition-related behaviours are the most neglected in clinical practice generally [19] and specifically among physiotherapists. Not much is documented of physiotherapists' practices in terms of assessing and managing dietary risk factors in their patients. A study among physiotherapists in Ireland showed that the majority (55%) only assessed the dietary status of their patients opportunistically (i.e., "sometimes") at the initial consultation, with only 39% likely to assess dietary status at follow-up visits [15]. In a study among Australian physiotherapists, it was found that ~42% of the sample studied provided dietary advice as part of weight reduction even when the majority

(81.5%) strongly agreed that it should be part of their intervention [20]. The most common barriers to the prevention of this key component of physiotherapy practice were lack of time and expertise in this area [15].

Various researchers believe that addressing these limitations are key to future physiotherapy practice [14,15,21]. A recent assessment of physiotherapy curricula in six countries in North America, Europe, and Asia Pacific showed that 94% of the programmes included theory teaching on basic nutritional counselling [22]. According to this report, however, only 35% of the programmes have practical sessions, with < 12% examining nutritional counselling as a clinical competence requirement for physiotherapy entry-level programmes [22]. Furthermore, it was observed that nutritional counselling, as with other health promotion topics, are now included in the majority of physiotherapy curricula [22]. Arguably, this is in response to the current global public health trends and the indications posed to health systems by emerging NCDs statistics.

Certainly, the 21<sup>st</sup> century physiotherapist needs to be able to provide education relating to unhealthy dieting issues directly, or else should refer patients to a specialist practitioner in their daily clinical practice irrespective of the patient's primary presenting diagnosis [23]. To date, no report has focused on practice with respect to nutrition counselling among physiotherapists practising in Africa, even when emerging evidence shows that Africa has the highest mortality rate from NCDs. The risk factors for NCDs and their related consequences could be effectively prevented or significantly reduced by physiotherapists who are "preeminently well positioned to fill this critical healthcare niche in the 21<sup>st</sup> century" [23].

This study was originally designed to provide preliminary data on current activities, competence, priorities, barriers, and perceived training needs regarding the lifestyle practice of physiotherapists in South East Nigeria. A part of our findings relating to physical activity promotion has been reported elsewhere [24]. In addition, this project has been extended to a national survey of lifestyle practices among physiotherapists in Nigeria [25] to provide a national baseline data for future cross country comparisons while maintaining regional reference data to monitor progress in local interventions.

The present paper reports on the practices and barriers to diet counselling practices among physiotherapists in South-east Nigeria. It is important to provide a detailed snapshot of the physiotherapists' practices outside the traditional professional boundary such as nutritional counselling. Additionally, given that interventions in terms of training and policy changes are likely to begin as local or regional interventions, providing regional specific documentation will aid in effective and efficient evaluation and monitoring of intervention. This will enable informed decision on continuity and needed refinement prior to extension to the national level.

## Methods

### Background on Nigeria and the context of physiotherapy profession and practice

Nigeria, a country in western Africa, has a population of > 160 million as of 2010, and is divided into six geopolitical

zones. The Igbo tribe, which occupies the southeast zone, has a population of > 30 million people [26]. According to the current literature, there is one physiotherapist available to serve every 86,800 Nigerian [27]. However, this ratio could be disputed because many Nigerian-trained physiotherapists leave the country in search of greener pastures. Similarly, the board register does not specify the state where a registrant is currently practicing or whether or not a registrant is used. This makes it difficult to accurately determine the number of physiotherapists in Nigeria, and specifically South East Nigeria. However, the Nigeria Society of Physiotherapy and their various state chapters maintain a register of inducted members of the society. Given the limitations of the two registers, it is difficult to put a summary on the national and regional physiotherapist/population ratio, as well as drawing comparisons between national and southeast physiotherapy populations.

That notwithstanding, physiotherapy services in Nigeria are available primarily in tertiary-care settings and, to a lesser extent, in secondary care settings. Apart from a very few private clinics, physiotherapy services are almost nonexistent in primary care [24].

## Research design

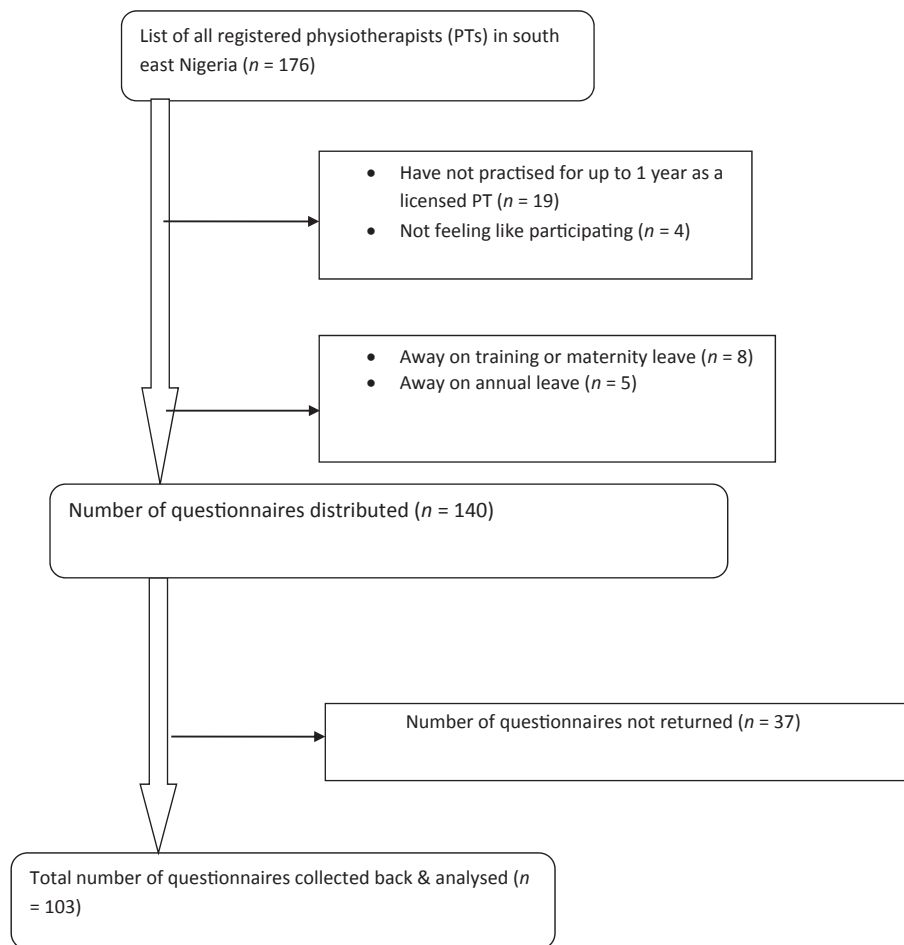
This population-based study used a cross-sectional descriptive design.

## Population and sampling

Purposive sampling was used to invite all physiotherapists working in South East Nigeria to participate in the survey. The criteria used to select participants included practising in either the private or government healthcare setting and having full- or part-time employment. From the records of the state chapters of the Nigerian Society of Physiotherapy, there are ~176 fully registered physiotherapists working in the five south-eastern states of Nigeria. Among these, 19 had not worked for a period of 12 months as fully registered physiotherapists. In addition, five physiotherapists were on their annual leave, and eight physiotherapists were away from their workplace because they were either on training or maternity leave. A further four physiotherapists were not willing to participate. A total of 140 questionnaires were distributed and 103 were duly completed and returned, thus yielding a response rate of 73%. The survey flowchart is shown in Figure 1.

## Procedure

The conduct and protocol of this study was executed according to the approval given by the Ethical and Research Committee of the University of Nigeria Teaching Hospital, Enugu, Nigeria. Following institutional ethical approval, the state chapters of the Nigerian Society of Physiotherapy were contacted to obtain the number and contact details of physiotherapists currently practising in the five states of South East Nigeria. The physiotherapists were approached personally by research assistants who were final-year physiotherapy students of the University of Nigeria, using the contact details provided. All participants signed a



**Figure 1.** Flowchart describing the recruitment of respondents.

voluntary written consent form applicable to the study after receiving a detailed explanation of the purpose and expectation of the research, with confidentiality assured. The questionnaires were distributed to physiotherapists at hospital departments, clinics, and medical centres. Upon delivery of the questionnaire to a respondent, the sex, state, and telephone numbers of the respondent would be coded into the questionnaire, as well as recorded by the research assistant for follow-up calls. Respondents were reminded to complete the questionnaire via telephone calls made twice a week to those who had not filled in the questionnaire. A maximum of 4 weeks was allowed for participants to complete the questionnaire, after which the research assistants collected the completed questionnaires from the physiotherapists. The data collection period lasted for 3 months (from March 2014 and May 2014).

### Questionnaire

This study used a questionnaire described in 2008 by Laws et al [28] and modified by O'Donoghue and colleagues [15] for use among physiotherapists. It is a 23-item questionnaire, presented within five key domains: (1) assessment of risk factors, (2) management of risk factors, (3) lifestyle counselling, (4) barriers to assessing and managing lifestyle risk factors, and (5) education and training of

physiotherapists. This questionnaire used a 4-point Likert scale of never, sometimes, usually, and always. Only the sections relating to diet are reported on in this manuscript.

The questionnaire's content validity was established by a research panel in the Republic of Ireland, via prior piloting and amendment [15], and further refinement was completed by two researchers in Nigeria. The questionnaire is believed to be valid for use among Nigerian physiotherapists because both Nigeria and the Republic of Ireland have comparable physiotherapy professional education based on the British model. Also, a good to excellent reliability through Kappa coefficients analysis for items and whole questionnaires has been reported in an earlier publication in this population [24].

### Data analysis

The results were analysed using SPSS version 15 (IBM Corp., Armonk, NY, USA), with descriptive statistics of frequencies and percentages used in analysing the quantitative data.

### Results

The respondents' demographic data have been previously reported elsewhere [24]. Summarily, 103 respondents

participated in this study, of which 70% were male (72/103) with ages ranging from 25 years to 54 years, and post-graduation working experience of 2–22 years. Of the participants, 95% worked full time and 27.8% had worked in community health. The majority of the respondents (89%) practised in orthopaedic and musculoskeletal specialty, but in addition had clients who presented with neurologic, cardiopulmonary, and women's health conditions.

In the assessment of dietary status, 64% (66/103) of the respondents reported that they rarely (described as "never" or "sometimes") assessed dietary status in new patients and 66% (68/103) rarely did so in return patients. About half (52.4%, 54/103) "always" assessed any family history of cardiovascular disease (CVD) and diabetes, with only 16.5% (17/103) assessing anthropometric measures of their patients. In return, about one-third (34%, 35/103) of the respondents reported that they regularly (described as "usually" or "always") assessed diet, whereas 37.9% (39/103) of physiotherapists assessed family history of CVD and diabetes. Details are shown in [Table 1](#).

Regarding the management of patients with poor dietary habits, a majority of the physiotherapists reported that they regularly ("usually" or "always") advised an increase in fruit/vegetables (69.9%, 72/103) and fibre intake (55.3%, 57/103). However, 90% (94/103) rarely ("never" or "sometimes") provided written advice relating to a balanced diet. In addition, 56% (57/103) rarely referred patients to other service providers or support groups for dietary programmes, with about the same number (52%, 54/103) reporting that they rarely found other accessible service providers or support groups (see [Table 2](#) for details).

In patients with identified physiological risk factors such as obese/overweight patients, although more than half (55.4–59.2%) of the respondents regularly recommended patients to consume less calories or less dietary fat, a substantial number of them (29.1–33.1%) never provided their patients with this advice. In patients with impaired glucose tolerance, the majority of respondents (66%, 50/103) did not regularly provide advice relating to diet. In patients with high blood pressure, less calories were mostly recommended opportunistically (i.e., "sometimes") by

more than half of the respondents. In patients with hyperlipidemia, the most regular management approach reported was advising less dietary fat (51.5%, 53/103). Details are shown in [Table 2](#).

[Table 3](#) highlights that the majority of respondents (87.4%, 90/103) consider it very important to counsel patients with risk factors about a healthy diet, and regard it as a high priority (66%, 68/103) to address dietary risk factors as part of their normal clinical practice. They also expressed considerable confidence about providing dietary advice and thought that their advice to patients on a healthy diet was effective. Physiotherapists also reported that their patients all found dietary counselling to be acceptable. Most of the material used to provide written dietary advice was from professional bodies (29.1%, 30/103). More than half of the respondents, however, did not provide their patients with any written material.

Lack of access to health promotion staff/counsellors [85 (82.5%)] was the most frequently cited barrier, followed by lack of proper patient education materials [63 (61.2%)], uncertainty about what services to provide [35 (34.0%)], and lack of expertise in relation to the assessment of dietary risk factors [35 (34.0%)] and management. In the past year, 58.8% of the respondents have received no training in management/strategies for helping patients change their behaviour. See details in [Table 4](#).

## Discussion

The present study explored physiotherapists in Eastern Nigeria in terms of their dietary advice in their daily patient consultations and the barriers preventing them from doing this. The findings showed that, although physiotherapists are confident and considered the inclusion of dietary counselling as very important in their daily clinical work, they only assess dietary status opportunistically in both new and returning patients. The reason for this opportunistic approach was attributed to lack of access to a health promotion officer/counsellor as a means of providing diet counselling. Nevertheless, physiotherapists still believed

**Table 1** Physiotherapist responses with respect to assessment of dietary status in patients.<sup>a</sup>

	Never	Sometimes	Usually	Always
Frequency with which respondents assessed the following risks in new patients:				
Diet	9 (8.7)	57 (55.3)	17 (16.6)	20 (19.4)
Family history of cardiovascular disease/diabetes	5 (4.8)	19 (18.4)	25 (24.3)	54 (52.4)
Anthropometrics	16 (15.6)	42 (40.8)	28 (27.2)	17 (16.5)
Frequency with which respondents assessed the following risks in return patients over the past 3 mo				
Diet	15 (14.6)	53 (51.5)	20 (19.4)	15 (14.6)
Family history of cardiovascular disease/diabetes	11 (14.8)	24 (23.3)	25 (24.3)	39 (37.9)
Anthropometrics	23 (22.3)	40 (38.8)	21 (20.4)	19 (18.4)

Data are presented as *n* (%).

<sup>a</sup> In the text, "rarely" is used to describe the response of "never" and "sometimes", and for "regularly" the responses of "usually" and "always".



**Table 2** Responses relating to physiotherapists' management of patients in whom poor diet has been identified.<sup>a</sup>

	Never	Sometimes	Usually	Always
Frequency with which respondents gave advice regarding the following:				
1. Increase fruit/vegetable intake	4 (3.9)	27 (26.2)	29 (28.2)	43 (41.7)
2. Increase fibre intake	9 (8.7)	37 (35.9)	26 (25.2)	31 (30.1)
Frequency with which respondents gave written advice relating a balanced diet	61 (59.2)	32 (31.1)	7 (6.8)	3 (2.9)
Frequency with which respondents referred patients to other service providers or support groups for dietary programmes	19 (18.4)	39 (37.9)	23 (22.3)	22 (21.4)
Frequency with which respondents were able to access other service providers or support groups for diet advice	21 (20.4)	33 (32.0)	25 (24.3)	24 (23.3)
Frequency with which respondents did the following for patients who were overweight/obese:				
1. Recommend fewer calories	30 (29.1)	16 (15.5)	21 (20.4)	36 (35.0)
2. Advise less dietary fat	32 (31.1)	10 (9.7)	21 (20.4)	40 (38.8)
3. Advise increased fibre intake	34 (33.1)	14 (13.6)	17 (16.5)	38 (36.9)
4. Set a goal for weight loss	34 (33.1)	19 (18.4)	23 (22.3)	27 (26.2)
Frequency with which respondents did the following for patients diagnosed with impaired glucose tolerance:				
1. Recommend fewer calories	53 (51.4)	13 (12.6)	21 (20.4)	16 (15.5)
2. Advise less dietary fat	48 (46.6)	14 (13.6)	24 (23.3)	17 (16.5)
3. Advise increased fibre intake	46 (44.6)	15 (14.6)	20 (19.4)	22 (21.4)
Frequency with which respondents did the following for patients diagnosed with hypertension:				
1. Recommend fewer calories	11 (10.7)	56 (54.3)	15 (14.6)	21 (20.4)
2. Advise less dietary fat	6 (5.8)	47 (45.7)	21 (20.4)	29 (28.2)
3. Advise increased fibre intake	10 (9.7)	41 (39.8)	24 (23.3)	28 (27.2)
4. Set a goal for weight loss	8 (7.8)	24 (23.3)	45 (43.7)	27 (26.2)
Frequency with which respondents did the following for patients diagnosed with hyperlipidemia:				
1. Recommend fewer calories	40 (38.9)	19 (18.4)	21 (20.4)	23 (22.3)
2. Advise less dietary fat	40 (38.9)	10 (9.7)	22 (21.4)	31 (30.1)
3. Advise increased fibre intake	41 (39.8)	13 (12.6)	20 (19.4)	29 (28.2)
4. Set a goal for weight loss	12 (11.7)	47 (45.6)	18 (17.5)	26 (25.2)

Data are presented as *n* (%).

<sup>a</sup> In the text, "rarely" is used to describe response of "never" and "sometimes", and for "regularly" the responses of "usually" and "always".

that the diet counselling that they give to their patients is effective in helping them change their unhealthy dieting habits, and patients find it acceptable for them to raise diet issues as part of their consultation.

Findings regarding physiotherapist assessment of dietary status of patients are not surprising, as currently nutrition/diet counselling is not traditionally considered core to the clinical practice of physiotherapists in Nigeria. A report by O'Donoghue and colleagues [15] among primary care physiotherapists in Ireland showed that only half of the respondents reported that they assessed nutritional status, with even fewer providing any intervention, which is similar to the findings in this present study. Similarly, only a minority of Australian physiotherapists reported providing dietary advice, even when they strongly agreed that it should be part of weight reduction intervention [20]. Interestingly, a survey of physical activity promotion

among National Health Service (NHS)-registered dietitians [29] indicated that, although it is not their specialist area, 93% reported that they regularly promoted physical activity, highlighting that healthcare professionals could make their clients mindful of lifestyle matters outside of their immediate area of expertise. It does appear that although physiotherapists are confident and considered the inclusion of dietary counselling an important part of their daily clinical duties, they would rarely assess their patient dietary status owing to a lack of access to health nutrition counsellors. Could the physiotherapists have assessed more patients if they have access to counsellors or if they possess the skill to determine the appropriate intervention to give? An answer to this is required in formulating a best-fit intervention to enhance promotion of healthy nutrition of patients in the physiotherapists' routine practice.

**Table 3** Physiotherapists' beliefs regarding the importance of effectiveness of advice they gave, patients' acceptance of the physiotherapist's counsel, and sources of written materials given.

	<i>n (%)</i>
Respondents' perceived importance of counselling about a healthy diet	
Very important	90 (87.4)
Moderately important	8 (7.8)
Somewhat important	1 (1.0)
Not very important	4 (3.9)
Source of the written materials respondents most frequently gave to patients	
No material given	52 (50.5)
Government publications	10 (9.7)
Charities	8 (7.8)
Professional bodies	30 (29.1)
Other sources	3 (2.9)
Respondents' perception of patients' acceptability of diet issues raised during physiotherapy consultation	
Very acceptable	55 (53.4)
Moderately acceptable	36 (34.9)
Somewhat acceptable	12 (11.7)
Not very acceptable	0 (0)
Respondents' perception of the priority in addressing dietary risk factors as part of normal clinical work	
High priority	68 (66.0)
Moderate priority	32 (31.1)
Somewhat of a priority	3 (2.9)
Not a priority	0 (0.0)
Respondents' perception of their confidence in assessing nutritional status	
Very confident	54 (42.2)
Moderately confident	26 (25.2)
Somewhat confident	19 (18.4)
Not confident	4 (3.9)
Respondents' perception of the effectiveness of the advice they provided in helping patients change unhealthy dietary habits	
Very effective	50 (48.5)
Somewhat effective	43 (4.7)
Not effective	9 (8.8)
No advice provided	1 (1.0)

Our findings have implications in terms of physiotherapist preparedness to support principles of good healthcare transformation and to expand its core/traditional clinical competence in order to play a more active role in the changing healthcare context. With the present high rate of NCD mortality and morbidity in Nigeria [4], a holistic care and preventive health approach should be one of the foci of the physiotherapy profession as physiotherapists are originally experts in preventive health education. Additionally, promotion of proper nutrition is an important component of the Alma Ata Declaration on Primary Health Care [30]. For physiotherapists to key into this declaration and play a contemporary role, theoretical knowledge of diet, nutrition, and NCDs in addition to practical skills training related

to nutritional counselling is warranted. Guided counselling and motivational interviewing skills are important practical counselling skills that physiotherapists must learn, because a behavioural change is required for developing a new nutrition and diet habit pattern in people with nutritional risk factors [31].

Relevant strategies, including further education of physiotherapists in health promotion with diet counselling incorporated as part of core clinical competence in physiotherapy practice, are warranted. Certainly, entry-level physiotherapy curricula in Nigeria need to be evaluated in terms of their adequacy to provide graduates with complete or relevant skills and strategies to address emerging healthcare needs, including health promotion and wellness, and illness prevention particularly, as it relates to combating NCDs. There have been calls for physiotherapists to go beyond physical activity practice and to embrace other lifestyle practices [14,18,23,32], and to include diet counselling as a clinical competence for physiotherapists particularly targeting the assessment and management for preventing NCDs or chronic diseases of lifestyle [15]. A range of mechanisms could be used to integrate nutritional promotion in patient consultation including provision of self-help material and computer-tailored messages [33].

One of the positive findings from this study is that physiotherapists regularly assess the family history of CVD and diabetes. This is beneficial because early detection of risk factors is key to the prevention of NCDs, and sensitises individuals to their susceptibility to these diseases; thus caution should be taken in their dietary lifestyle choices. Conversely, like dietary status, anthropometrics are opportunistically assessed. This is unfortunate because empirical studies have shown a significant correlation between diet quality and body composition [34,35], and between body composition (body fat) and the incidence of NCDs such as CVD [36].

In the management of patients in whom poor/unhealthy diets were identified, the majority of physiotherapists regularly provided verbal advice regarding increased fruit/vegetables and fibre intake. A good number (43.7%) also regularly referred patients to other service providers when these were available. These are positive findings as epidemiological evidence suggests that people who regularly eat diets high in fruits and vegetables have lower risks of certain chronic conditions such as heart diseases and type 2 diabetes [6]. At present, there is no Nigerian guide to healthy eating recommendations. However, physiotherapy bodies worldwide including the WCPT agree that it is imperative that physiotherapy enhance its perception, knowledge, and skills in contemporary and emerging health trends, including health promotion and wellness.

Specifically, the majority of physiotherapists "never" provided written advice to patients with approximately half of them reporting that they used "no materials". Generally, with the exception of hypertension, providing diet counselling to patients with intermediate NCD conditions such as overweight/obesity, impaired glucose tolerance, or hyperlipidemia was generally poor with the number of those who "never" and those who "always" provide advice almost equal. These areas should receive more attention, the reason being that these patients have a higher chance of deteriorating into more dangerous and complicated stages

**Table 4** Respondents' perceived barriers to and training in relation to the promotion of healthy nutrition.

	n (%)
Respondents' perception of the following as the main barriers preventing them from providing appropriate lifestyle interventions as dietary advice	
Lack of time	25 (7.8)
Lack of access to health promotion staff/counsellors	85 (82.5)
Personal lack of interest in providing preventive services	7 (6.8)
Lack of proper patient education materials	63 (61.2)
Uncertainty about what services to provide	35 (34.0)
Lack of interest from patient	6 (5.8)
Lack of expertise in relation to dietary risk factors assessment & management	35 (34.0)
Respondents' participation in training in the management of risk factors or strategies for helping patients to change their behaviour in the past 12 mo prior to the commencement of this study	
Yes	40 (38.8)
No	57 (58.8)

of chronic diseases of lifestyle if there are no changes in dietary lifestyle patterns.

More than 80% of the physiotherapists reported that they think it is very important and generally have the right attitude towards providing dietary lifestyle interventions. This is limited by lack of access to health promotion staff/counsellors for those who require more intensive therapy. In addition, lack of proper patient education materials, lack of expertise in relation to dietary risk factors' assessment and management, with consequent uncertainty about what services to provide, were reported as a substantial barrier among other factors. Because health promotion is not a regulated profession in Nigeria, the best approach to enhancing health promotion resources should be one that encourages all healthcare professionals to improve their skills. This holds true for diet counselling in physiotherapy practice. It is therefore imperative that the Nigerian Society of Physiotherapists develops a short- and long-term action plan with respect to 21<sup>st</sup> century population health requirements, particularly for the management of NCDs. This study provides baseline data, without which Nigeria may perhaps continue to lag behind in incorporating the evidence base into physiotherapy practice in an important area of lifestyle practice.

## Conclusion and implications

This study was designed to provide the current picture of physiotherapy practice in terms of promotion of dietary counselling in daily clinical practice and barriers militating against it. This study is novel in being the first to provide a

detailed report on physiotherapists' practice, belief, barriers, and training specific to dietary counselling. The findings reveal that although physiotherapists are confident and considered incorporating dietary counselling in daily clinical practice as very important, diet counselling was done opportunistically in contemporary physiotherapy practice. Several barriers to making diet counselling a key component of physiotherapy practice were identified. Our findings may be useful to the Nigerian Society of Physiotherapy, WCPT, and other national physiotherapy associations and regulatory bodies in both informing and developing content specifically related to addressing diet counselling in routine clinical practice.

## Limitations

This study should be interpreted in line with several limitations. This study only used South East Nigeria as its sampling frame, and the sample size was relatively small. However, because we used total population sampling, potential selection bias may have been overcome and findings may provide preliminary data relating to contemporary physiotherapy practice in an important area of the current global health agenda. Finally, recall bias and social desirability bias may be an issue in our study because we relied solely on self-reported questionnaires as a tool for data collection.

## Conflicts of interest

All authors declare that there is no conflict of interest associated with the present publication.

## Funding/support

No financial or material support of any kind was received for the work described in this article.

## Acknowledgements

The authors are grateful to G. O'Donoghue, C. Cunningham, F. Murphy, C. Woods, and J. Aagaard-Hansen for permission to use their questionnaire for this study.

## References

- [1] Beaglehole R, Bonita R, Alleyne G, Horton G, Li L, Lincoln P, et al. for The LancetNCD Action Group. UN high-level meeting on non-communicable disease: addressing four questions. *Lancet* 2011;378:449–56.
- [2] Akarolo-Anthony S, Willett WC, Spiegelman D, Adebamowo CA. Obesity epidemic has emerged among Nigerians. *BMC Pub Health* 2014;14:455.
- [3] Akarolo-Anthony S, Odubore FO, Yilme S, Aragbada O, Odonye G, Hu FB, et al. Pattern of dietary carbohydrate intake in urbanised adult Nigerians. *Int J Food Sci Nutr* 2013; 64:292–9.
- [4] World Health Organization. Noncommunicable Diseases (NCD) Country Profiles. Geneva: World Health Organization; 2014. Available from: [www.who.int](http://www.who.int) [accessed 20.09.14].



- [5] World Confederation for Physical Therapy WCPT policy statement: non-communicable diseases. Draft London UK World confederation for physical therapy 2014. Available from: [www.wcpt.org/policy/ps-ncd](http://www.wcpt.org/policy/ps-ncd) [accessed 29.11.14].
- [6] Al-Sinani M, Min Y, Ghebremeskel K, Qazaq HS. Effectiveness of and adherence to dietary and lifestyle counselling. Effect on metabolic control in type 2 diabetic Omani patients. *SQU Med J* 2010;10:341–9.
- [7] Lindstrom J, Eriksson JG, Valle TT, Aunola S, Cepaitis Z, Hakumaki M, et al. Prevention of diabetes mellitus in subjects with impaired glucose tolerance in the Finnish Diabetes Prevention Study: results from a randomised clinical trial. *J Am Soc Nephrol* 2003;4:5108–13.
- [8] Ibanez J, Izquierdo M, Martinez-Labari C, Ortega F, Grijalba A, Forga L, et al. Resistance training improves cardiovascular risk factors in obese women despite a significant decrease in serum adiponectin levels. *Obesity (Silver Spring)* 2010;18:535–41.
- [9] Blumenthal JA, Babyak MA, Sherwood A, Craighead L, Lin PH, Johnson J, et al. Effects of the dietary approaches to stop hypertension by diet alone and in combination with exercise and caloric restriction on insulin sensitivity and lipids. *Hypertension* 2010;55:1199–205.
- [10] Straznicky NE, Lambert EA, Grima MT, Eikelis N, Nestel PJ, Dawood T, et al. The effects of dietary weight loss with or without exercise training on liver enzymes in obese metabolic syndrome subjects. *Diabetes Obes Metab* 2012;14:139–48.
- [11] Ranga JAD, Appuhamy N, Kebreab E, Simon M, Yada R, Milligan LP, et al. Effects of diet and exercise interventions on diabetes risk factors in adults without diabetes: meta-analyses of controlled trials. *Diabet Metab Syndr* 2014;6:127.
- [12] Mulcahy A, Jones S, Strauss G, Cooper I. The impact of recent physiotherapy graduates in the workforce: a study of Curtin University entry-level graduate physiotherapists 2000–2004. *Aust Health Rev* 2010;34:252–9.
- [13] Frerichs W, Kaltenbacher E, van de Leur JP, Dean E. Can physical therapists counsel patients with lifestyle-related health conditions effectively? A systematic review and implications. *Physiother Theory Pract* 2012;28:571–87.
- [14] Bury T, Moffat M. Physiotherapists have a vital part to play in combating the burden of non-communicable diseases. *Physiotherapy* 2014;100:94–6.
- [15] O'Donoghue G, Cunningham C, Murphy F, Woods C, Aagaard-Hansen J. Assessment and management of risk factors for the prevention of lifestyle related disease: a cross-sectional survey of current activities, barriers and perceived training needs of primary care physiotherapists in the Republic of Ireland. *Physiotherapy* 2014;100:116–22.
- [16] Aweto HA, Oligbo CN, Fapojuwo OA, Olawale OA. Knowledge, attitude and practice of physiotherapists towards promotion of physically active lifestyles in patient management. *BMC Health Serv Res* 2013;13:21.
- [17] Frantz JM, Ngambare R. Physical activity and health promotion strategies among physiotherapists in Rwanda. *Afr Health Scis* 2013;13:17–23.
- [18] Bodner ME, Miller WC, Rhodes RE, Dean E. Smoking cessation and counselling: knowledge and views of Canadian physical therapists. *Phys Ther* 2011;91:1051–62.
- [19] Kopelman P, Lennard-Jones J. Nutrition and patients: a doctor's responsibility. *Clin Med* 2002;2:391–4.
- [20] Snodgrass SJ, Cater AE, Guest M, Collins CE, James C, Kable AK, et al. Weight management including dietary and physical advice provided by Australian physiotherapists: a pilot cross-sectional survey. *Physiother Theo Pract* 2014;30:409–20.
- [21] McMahon N, Connolly C. Health promotion knowledge, attitudes and practices of chartered physiotherapists in Ireland: a national survey. *Physiother Pract Res* 2013;34:21–8.
- [22] Bodner ME, Rhodes RE, Miller WC, Dean E. Smoking cessation and counselling practices of Canadian physical therapists. *Am J Prev Med* 2012;43:67–71.
- [23] Dean E. Physical therapy in the 21st century: Part I. Toward practice informed by epidemiology and the crisis of lifestyle conditions. *Physiother Theory Pract* 2009;25:330–53.
- [24] Abaraogu UO, Ogaga MO, Dean E. Lifestyle-related risk factor assessment and intervention practices of Nigerian physiotherapists. *Physiother Theory Pract* 2016 (in press).
- [25] Abaraogu UO, Juliet Edeonu, Frantz JM. Promotion of physical activity and exercise in daily practice: current practices, barriers and training needs of physiotherapists: the case for eastern Nigeria. *Physiother Can* 2016;68:37–45.
- [26] Ezeokana JO. Divorce: its psychological effects on the divorced women and their children: a study on the Igbo of Southern Nigeria. New York: Peter Lang; 1999. p. 22.
- [27] Balogun J, Aka P. A descriptive study of the professionalization of twelve major occupations in Nigeria. In: Scientific Session of the 55th Annual Conference of the Nigeria Society of Physiotherapy Lokoja, Kogi State, Nigeria; October 28, 2015.
- [28] Laws RA, Kirby SE, Powell Davies GP, Williams AM, Jayasinghe UW, Amoroso CL, et al. 'Should I and can I?': a mixed methods study of clinician beliefs and attitudes in the management of lifestyle risk factors in primary health care. *BMC Health Serv Res* 2008;8:44.
- [29] Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States 2000. *J Am Med Assoc* 2004;291:1238–45.
- [30] World Health Organization. Report of the International Conference on Primary Health Care, Alma-Ata, USSR, 6–12 September 1978. Geneva: World Health Organization; 1978. Available from: [whqlibdoc.who.int/publications/9241800011.pdf](http://whqlibdoc.who.int/publications/9241800011.pdf) [accessed 23.06.16].
- [31] Britt E, Hudson SM, Blampied NM. Motivational interviewing in health settings: a review. *Patient Educ Counsel* 2004;53:147–55.
- [32] McMahon S, Cusack T, O'Donoghue G. Barriers and facilitators to providing undergraduate physiotherapy clinical education in the primary care setting: a three-round Delphi study. *Physiotherapy* 2014;100:14–9.
- [33] McKeivith B, Stanner S, Buttriss J. Food choices in primary care: a summary of the evidence. *Nurs Times* 2005;101:38–42.
- [34] Nicklas TA, O'Neil CE, Fulgoni VL. Diet quality is inversely related to cardiovascular risk factors in adults. *J Nutr* 2012;142:2112–8.
- [35] Gao SK, Beresford SA, Frank LL, Schreiner PJ, Burke GL, Fitzpatrick AL. Modifications to the healthy eating index and its ability to predict obesity: the multi-ethnic study of atherosclerosis. *Am J Clin Nutr* 2008;88:64–9.
- [36] Chuang HH, Li WC, Sheu BF, Liao SC, Chen JY, Chang KC, et al. Correlation between body composition and risk factors for cardiovascular disease and metabolic syndrome. *J Biofact* 2012;38:284–91.